

What is claimed is:

1. A methanol reforming catalyst, comprising:
a catalytic component I containing Cu oxide and Zn oxide; and
a catalytic component II containing metal oxide and one of Pt and Pd.
- 5 2. The methanol reforming catalyst as in claim 1, further comprising:
a first catalyst portion; and
a second catalyst portion formed on the first catalyst portion;
wherein the catalytic component I is mainly contained in the first catalyst
portion, and
10 the catalytic component II is mainly contained in the second catalyst
portion.
3. The methanol reforming catalyst as in claim 1, further comprising:
a catalyst portion in which the catalytic component I and the catalytic
component II are dispersed and mixed.
- 15 4. The methanol reforming catalyst as in ~~any one of claims 1-3~~ ^{CLAIM 1}, wherein
the metal oxide is at least one selected from the group consisting of alumina,
cerium oxide, zirconia, silica, titania, magnesia, zinc oxide, gallium oxide, and
indium oxide.
- 20 5. The methanol reforming catalyst as in ~~any one of claims 1-3~~ ^{CLAIM 1}, wherein
the catalytic component II contains palladium, zinc oxide, cerium oxide, and
zirconia.
6. A methanol reforming catalyst, comprising:
a catalytic component I containing Cu oxide and Zn oxide;
a catalytic component IIA containing a first metal oxide and a noble
25 metal; and
a catalytic component IIB containing a second metal oxide and one of Pt
and Pd;
wherein the second metal oxide forms an alloy with noble metal more
easily than the first metal oxide.
- 30 7. The methanol reforming catalyst as in claim 6, further comprising:
a catalyst substrate;
a first layer formed on the catalyst substrate;
a second layer formed on the first layer; and
a third layer formed on the second layer;
35 wherein the catalytic component I is mainly contained in the second
layer,

the catalytic component IIA is mainly contained in the first layer, and the catalytic component IIB is mainly contained in the third layer.

8. The methanol reforming catalyst as in claim 6, further comprising:
a catalyst substrate;

5 a first layer formed on the catalyst substrate; and
a second layer formed on the first layer;

wherein the catalytic component I and the catalytic component IIA are mixed and mainly contained in the first layer, and

the catalytic component IIB is mainly contained in the second layer.

A 10 9. The methanol reforming catalyst as in ~~any one of claims 6-8~~ ^{CLAIM 6}, wherein the first metal oxide is at least one selected from the group consisting of alumina, cerium oxide, zirconia, and silica, and

the second oxide is at least one selected from the group consisting of titania, magnesia, zinc oxide, gallium oxide, and indium oxide.

A 15 10. The methanol reforming catalyst as in ~~any one of claims 6-8~~ ^{CLAIM 6}, wherein the catalytic component IIB contains palladium, zinc oxide, cerium oxide, and zirconia.

11. A method of reforming methanol using the methanol reforming catalyst set forth in claim 1, comprising:

20 promoting a methanol reforming reaction by bringing a mixed gas containing methanol, steam, and oxygen into contact with the catalytic component II; and

promoting the methanol reforming reaction by bringing a gas reformed in above step and the mixed gas into contact with the catalytic component I.

25 12. A method of reforming methanol using the methanol reforming catalyst set forth in claim 6, comprising the steps of:

promoting a methanol reforming reaction by bringing a mixed gas containing methanol, steam, and oxygen into contact with the catalytic component IIB; and

30 promoting the methanol reforming reaction by bringing a gas reformed in above step and the mixed gas into contact with the catalytic component I and the catalytic component IIA simultaneously or successively.

13. A reformer for reforming methanol, comprising:

an inlet port of a gas;

35 a reactor vessel having the methanol reforming catalyst set forth in claim 1 in its inside, and for causing a reforming reaction of a gas supplied from the

inlet port of the gas; and

an outlet port of a gas reformed by the reactor vessel.

14. A reformer for reforming methanol, comprising:

an inlet port of a gas;

5 a reactor vessel having the methanol reforming catalyst set forth in claim
6 in its inside, and for causing a reforming reaction of a gas supplied from the
inlet port of the gas; and

an outlet port of a gas reformed by the reactor vessel.

15. A methanol reforming apparatus, comprising:

10 a methanol supply source;

an oxygen supply source;

a steam supply source;

the methanol reformer set forth in claim 13; and

15 pipes supplying methanol, oxygen, and steam supplied from respective
supply sources to the methanol reformer.

16. A methanol reforming apparatus, comprising:

a methanol supply source;

an oxygen supply source;

a steam supply source;

20 the methanol reformer set forth in claim 14; and

pipes supplying methanol, oxygen, and steam supplied from respective
supply sources to the methanol reformer.

17. A fuel cell system, comprising:

the methanol reforming apparatus set forth in claim 15;

25 a fuel cell;

a pipe supplying a gas reformed by the methanol reforming apparatus to
the fuel cell; and

a pipe supplying a gas containing oxygen to the fuel cell.

18. A fuel cell system, comprising:

30 the methanol reforming apparatus set forth in claim 16;

a fuel cell;

a pipe supplying a gas reformed by the methanol reforming apparatus to
the fuel cell; and

a pipe supplying a gas containing oxygen to the fuel cell.

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